



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.          | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------|-------------|----------------------|---------------------|------------------|
| 10/574,656               | 04/04/2006  | Sang Ik Lee          | K-0789              | 7608             |
| 34610                    | 7590        | 08/10/2009           |                     |                  |
| KED & ASSOCIATES, LLP    |             |                      | EXAMINER            |                  |
| P.O. Box 221200          |             |                      | RAHIM, AZIM         |                  |
| Chantilly, VA 20153-1200 |             |                      | ART UNIT            | PAPER NUMBER     |
|                          |             |                      | 3744                |                  |
|                          |             |                      |                     |                  |
|                          |             |                      | MAIL DATE           | DELIVERY MODE    |
|                          |             |                      | 08/10/2009          | PAPER            |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/574,656             | LEE ET AL.          |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | AZIM RAHIM             | 3744                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 17 June 2009.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-20 and 22-25 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-20 and 22-25 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 04 April 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date 6/17/2009.

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

***Information Disclosure Statement***

1. The information disclosure statement filed 6/17/2009 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the applicant has not provided an explanation in English or an English translation of the foreign document that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because the use of legal phraseology such as "means" is recited in the abstract line 7. Correction is required. See MPEP § 608.01(b).

#### ***Claim Objections***

4. Claims 5, 6, 22, 24 and 25 and objected to because of the following informalities: In claims 5 and claim 25, lines 1-2, the limitation "wherein the rotating plate covers" should be corrected to recite --wherein ***at least one of*** the rotating plates covers--. In claims 6 and 24, the limitation "wherein the rotating plate" should be corrected to recite --wherein ***at least one of*** the rotating plates--. In claim 22, line 1, the recitation "*claim 21*" should be corrected to recite --***claim 12***--. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko (US 6,286,326) in view of Kim et al. (Kim, US 5,987,904).

Regarding claims 1, 2 and 7, Kopko discloses a refrigerator arrangement (referring to figure 2) comprising: a duct (59) in fluid communication with a freezer compartment (55) and a fresh-food compartment (56) via flaps (53, 54, 57, and 58) disposed adjacent to both of said compartments (illustrated in figure 2); wherein the duct includes an evaporator/refrigerant pipe assembly (52) and a reversing fan (51) capable of moving air in two directions, thus opening a first set of flaps (53 and 54) and closing a second pair of flaps (57 and 58) when the fan moves air in one direction and closing the first set of flaps and opening the second pair of flaps when the fan moves air in another direction opposite the first direction (see column 4, lines 23-40). It is noted that the operation of the reversing fan is indicative that some type of driving means (i.e. a motor) controls the rotation of the fan. Also, it is noted that the recitation "so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device" is merely a statement of intended use and lends no additional structure to the claimed invention, and the applicant is reminded that a recitation with respect to the manner in which a claimed apparatus is intended to be employed

does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here. However, Kopko fail to disclose a defrost heater positioned within the duct. Kim teaches a refrigerator (referring to figure 3) that includes an evaporator (11), a fan (15), and a defrost heater (17) disposed within a duct (illustrated in figure 3), wherein the defrost heater is selectively operated in a defrost operation (see column 1, lines 55-58). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Kopko to include the defrost heater as taught by Kim in order to prevent excess frost buildup on the evaporator, thus preventing the reduction in cooling efficiency due to the frost buildup.

Regarding claim 8, Kopko as modified by Kim teach all the limitations as described above, but fail to explicitly teach that the defrost heater is positioned between the fan and the evaporator. Although Kim is deficient in disposing the defrost heater between the evaporator and the fan, at the time the invention was made, it would have been an obvious matter of design choice to a person having ordinary skill in the art to dispose the defrost heater between the evaporator and the fan, because the Applicant has not disclosed that disposing the defrost heater between the evaporator and the fan provides a particular advantage, is used for a particular purpose, or solves a stated problem. One having ordinary skill in the art, furthermore, would have expected Kim's defrost heater disposition, and Applicant's invention to perform equally well with either the defrost heater disposition as taught by Kim and defrost heater being disposed between the fan and evaporator because both defrost heater dispositions would perform the same function of heating the evaporator during defrost operation. Therefore, it would have been a *prima facie* case of obviousness to modify Kim to obtain the invention as specified in claim 8

because such a modification would have been considered a mere design choice which fails to patentably distinguish over the prior art of Kim. Furthermore, one of ordinary skill in the art would have been motivated to dispose the defrost heater between the evaporator and the fan in order to provide a more compact arrangement within the duct, thus providing more space for additional items.

8. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim as applied to claim 2 above, and further in view of Reed (US 2,191,774).

Regarding claims 3-6, Kopko as modified by Kim teach all the limitations as described above, but fail to teach that the flaps comprise a supporting plate having a plurality of openings; a plurality of thin rotating plates each having one side coupled to the supporting plate by a hinge, and the other side rotatable upward by a predetermined angle to open the openings; wherein the rotating plate covers an upper circumference of the respective opening to close the opening; and wherein the rotating plate is held by a rear end of an adjacent rotating plate and the supporting plate to prevent the plate from rotating downward. Reed teaches a vane assembly (referring to figure 1) that includes a plurality of vanes (11) disposed downstream of a vent (1) and connected to a tie rod (14) via an axis (12) and a lever (13); wherein openings between the vanes are created when a predetermined amount of air is sucked through the vanes (illustrated in figure 1 and see column 2, lines 37-55), and when the vanes are closed, a portion of the vanes can lie onto an adjacent vane (see column 3, lines 51-65). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the flaps of Kopko as

modified by Kim to include the vane assembly as taught by Reed in order to provide increased directing of airflow, thus reducing air turbulence within the duct.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim as applied to claim 1 above, and further in view of Block (US 2002/0192075).

Regarding claim 9, Kopko as modified by Kim teach all the limitations as described above, but fail to teach that the defrost heater is fabricated as one unit with the fan. Block teaches the well known concept of providing a heating element on a fan for delivering hot fluid (see figure 1 and paragraph 21). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the reversing fan of Kopko as modified by Kim to include the heating elements as taught by Block in order to provide more warm air to be blown to the evaporator for defrosting purposes, thus reducing the amount of heat needed to melt the frost.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim as applied to claim 1 is above, and further in view of Carlstedt et al. (Carlstedt, US 5,765,384).

Regarding claim 10, Kopko as modified by Kim teach all the limitations as described above, but fail to teach a hot wire that functions as a resistance body connected to a power source for emission of heat; and a film of an electrical insulating material surrounding the hot wire. Carlstedt et al. teach the concept of providing an evaporator (10) having an electric cable (20) for

defrosting the evaporator (see abstract); wherein electric current is conducted through a resistance wire (24; see column 2, lines 3-5), having a thin film (insulation 26) surrounding the resistance wire (illustrated in figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Kopko as modified by Kim to include the defrost heater as taught by Carlstedt order to prevent ice buildup on the evaporator from clogging the cold air duct, thus increasing cooling efficiency.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim as applied to claim 1 is above, and further in view of Schenk et al. (Schenk, US 6,694,754).

Regarding claim 11, Kopko as modified by Kim teach all the limitations as described above, but fail to disclose a plurality of fins in contact with the refrigerant pipe. Schenk teaches a refrigerator (referring to figure 1) that includes an evaporator (30) having fins disposed around the refrigerant pipe (illustrated in figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the evaporator of Kopko as modified by Kim to include the fins as taught by Schenk in order to increase heat transfer between the refrigerant and the air passing through the evaporator, thus increasing cooling efficiency.

12. Claims 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko in view of Kim and Schenk.

Regarding claims 12 and 22, Kopko discloses a refrigerator arrangement (referring to figure 2) comprising: a duct (59) in fluid communication with a freezer compartment (55) and a fresh-food compartment (56) via flaps (53, 54, 57, and 58) disposed adjacent to both of said compartments (illustrated in figure 2); wherein the duct includes an evaporator/refrigerant pipe assembly (52) and a reversing fan (51) capable of moving air in two directions, thus opening a first set of flaps (53 and 54) and closing a second pair of flaps (57 and 58) when the fan moves air in one direction and closing the first set of flaps and opening the second pair of flaps when the fan moves air in another direction opposite the first direction (see column 4, lines 23-40). It is noted that the operation of the reversing fan is indicative that some type of driving means (i.e. a motor) controls the rotation of the fan. Also, it is noted that the recitation “so that the opening or closing between the space and the refrigerating chamber and the space and the freezing chamber are performed by the open/close device” is merely a statement of intended use and lends no additional structure to the claimed invention, and the applicant is reminded that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the structural limitations of the claims, as is the case here. However, Kopko fail to disclose a defrost heater positioned within the duct; and that the refrigerant pipe includes a plurality of fins. Kim teaches a refrigerator (referring to figure 3) that includes an evaporator (11), a fan (15), and a defrost heater (17) disposed within a duct (illustrated in figure 3), wherein the defrost heater is selectively operated in a defrost operation (see column 1, lines 55-58). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Kopko to include the defrost heater as taught by Kim in order to

prevent excess frost buildup on the evaporator, thus preventing the reduction in cooling efficiency due to the frost buildup. Schenk teaches a refrigerator (referring to figure 1) that includes an evaporator (30) having fins disposed around the refrigerant pipe (illustrated in figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the evaporator of Kopko as modified by Kim to include the fins as taught by Schenk in order to increase heat transfer between the refrigerant and the air passing through the evaporator, thus increasing cooling efficiency. Schenk teaches a refrigerator (referring to figure 1) that includes an evaporator (30) having fins disposed around the refrigerant pipe (illustrated in figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the evaporator of Kopko as modified by Kim to include the fins as taught by Schenk in order to increase heat transfer between the refrigerant and the air passing through the evaporator, thus increasing cooling efficiency.

13. Claims 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim and Schenk as applied to claim 12 above, and further in view of Carlstedt.

Regarding claims 13 and 20, Kopko as modified by Kim and Schenk teach all the limitations as described above, but fail to teach a hot wire that functions as a resistance body connected to a power source for emission of heat; a film of an electrical insulating material surrounding the hot wire; and wherein at least a portion of the plurality of fins have insertion slots in side surfaces configured to receive the defrost heater. Carlstedt et al. teach the concept of providing an evaporator (10) having a tubular element (12) disposed within fins (14) of the evaporator (10); wherein the tubular element includes a bent electric cable (20) for defrosting an

evaporator (see abstract); wherein electric current is conducted through a resistance wire (24; see column 2, lines 3-5), having a thin film (insulation 26) surrounding the resistance wire (illustrated in figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Kopko as modified by Kim to include the defrosting arrangement as taught by Carlstedt order to prevent ice buildup on the evaporator from clogging the cold air duct, thus increasing cooling efficiency.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim and Carlstedt as applied to claim 13 above, and further in view of Lindseth (US 2,000,467).

Regarding claim 14, Kopko as modified by Kim and Carlstedt teach all the limitations as described above, but fail to teach that the hot wire is a carbon hot wire. Lindseth teaches the well known concept of a heating element being made of carbon (see column 2, lines 35-38). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hot wire of Kopko as modified by Kim and Carlstedt to include the carbon as taught by Lindseth in order to reduce the noise generated by the power source and to withstand higher tolerances, thus increasing heating efficiency.

15. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim and Carlstedt as applied to claim 13 above, and further in view of Komatsu (US 5,594,585).

Regarding claims 15 and 16, Schenk et al. as modified by Carlstedt et al. teach all of the limitations of the claimed invention, but fail to teach that the film is formed of PET material and wherein the defrosting heater is a PTC device. Komatsu teaches the concept of using a positive temperature coefficient thermistor (PTC) heater as a heating device (column 3, lines 41-46) and laminating the PTC heater with a PET film (column 3, lines 46-49). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the film of Kopko as modified by Kim and Carlstedt to be made of the PET material as taught by Komatsu in order to prevent the while of the cold air duct from being heated, thus increasing cooling efficiency. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the defrost heater of Kopko as modified by Kim and Carlstedt with the PTC device as taught by Komatsu in order to regulate the defrost temperature without a temperature control circuit, thus increasing efficiency.

16. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim and Schenk as applied to claim 12 above, and further in view of Kobayashi et al. (Kobayashi, US 4,369,350).

Regarding claims 17 and 18, Kopko as modified by Kim and Schenk teach all the limitations as described above, but fail to explicitly teach that the defrost heater is attached to at least one side of the plurality of fins. Kobayashi teaches an evaporator for a refrigerating device (referring to figures 7-9) that includes refrigerant tubing (9), a plurality of fins (8), wherein a heater (10) is attached to the fins (illustrated in figure 9) for defrosting purposes (see column 3, lines 50-61). It would have been obvious to one having ordinary skill in the art at the time the

invention was made to have modified the evaporator of Kopko as modified by Kim and Carlstedt to provide a defrost heater that is attached to a surface of the fins as taught by Kobayashi in order to provide quicker heating of the evaporator to melt the frost, thus preventing degradation of cooling efficiency.

17. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim and Schenk as applied to claim 12 above, and further in view of Seipp et al. (Seipp, US 4,369,350).

Regarding claim 19, Kopko as modified by Kim and Carlstedt teach all the limitations as described above, but fail to teach that the defrost heater has pass through holes for the at least one refrigerant pipe. Seipp et al. teaches a heat exchanger defrost apparatus [see figure 3] that includes a defrost heater (20) thermally connected to a plate (15), wherein the plate has perforations (25) for the heat exchanger tubes to pass therethrough [see column 2, lines 33-36]. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the evaporator of Kopko as modified by Kim and Carlstedt to include the defrost heater arrangement as taught by Seipp in order to provide quicker heating of the evaporator to melt the frost, thus preventing degradation of cooling efficiency.

18. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kopko as modified by Kim and Carlstedt as applied to claim 2 above, and further in view of Reed (US 2,191,774).

Regarding claims 23-25, Kopko as modified by Kim and Carlstedt teach all the limitations as described above, but fail to teach that the flaps comprise a supporting plate having a plurality of openings; a plurality of thin rotating plates each having one side coupled to the supporting plate by a hinge, and the other side rotatable upward by a predetermined angle to open the openings; and wherein the rotating plate covers an upper circumference of the respective opening to close the opening. Reed teaches a vane assembly (referring to figure 1) that includes a plurality of vanes (11) disposed downstream of a vent (1) and connected to a tie rod (14) via an axis (12) and a lever (13); wherein openings between the vanes are created when a predetermined amount of air is sucked through the vanes (illustrated in figure 1 and see column 2, lines 37-55), and when the vanes are closed, a portion of the vanes can lie onto an adjacent vane (see column 3, lines 51-65). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the flaps of Kopko as modified by Kim and Carlstedt to include the vane assembly as taught by Reed in order to provide increased directing of airflow, thus reducing air turbulence within the duct.

***Response to Arguments***

19. Applicant's arguments with respect to claims 1-20 and 22-25 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The

examiner can normally be reached on Monday - Thursday 7am - 3pm EST and Friday 7am - 9:30am EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. R./  
Examiner, Art Unit 3744  
7/26/2009

/Frantz F. Jules/  
Supervisory Patent Examiner, Art Unit 3744